

Amendments to the Claims:

The following listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) ~~Method~~ A method for optically detecting a double feed in an apparatus for processing one or more types of sheet-like objects, ~~particularly banknotes,~~ the method comprising:

~~characterised in that said~~ illuminating the sheet-like objects ~~are illuminated,~~
measuring transmission intensities of light transmitted through sampling
points of a specific sheet-like object of the sheet-like objects;

measuring reflection intensities of light reflected from the sampling points of
the specific sheet-like object;

producing a transmission image of a specific the specific sheet-like object from
the measured transmission intensities of said sheet-like objects is produced by measuring
transmission intensities of light transmitted through regions of said specific object;

producing and a reflection image from the measured ~~is produced by measuring~~
 reflection intensities ~~of light reflected from the said regions of said specific object where said~~
 double feed ~~is detected by~~

applying a two-dimensional evaluation method, method to detect the double
feed, the two-dimensional evaluation method comprising:

forming a first dimension of said two-dimensional evaluation method
~~being formed by said~~ from the measured transmission intensities intensities; and

forming a second dimension of said two-dimensional evaluation
~~method being formed by said~~ from the measured reflection intensities, intensities;

~~and wherein the two-dimensional evaluation method further comprises~~
determining ~~the location~~ locations of said ~~the~~ sampling points in said ~~two~~ the first and second
~~dimensions, dimensions;~~ and

comparing ~~said the~~ locations with a linear decision boundary.

2. (Currently Amended) The method as claimed in claim 1, further comprising:
~~characterised in that said sheet-like objects are sequentially fed~~ feeding the
sheet-like objects into ~~said the~~ apparatus ~~apparatus;~~

~~and conveyed~~ conveying the sheet-like objects along a transport path in a
moving ~~direction~~ direction;

~~where first~~ determining a position and an angle of a specific sheet-like object
with respect to ~~said the~~ transport path ~~are determined and where second said,~~

wherein the specific sheet-like object passes a multitude of sensor cells
arranged in at least one line being perpendicular to ~~said the~~ moving direction, direction, ~~said~~
the transmission intensities and ~~said the~~ reflection intensities being measured by determining
a multitude of sensor values for each sensor cell in fast succession ~~while said~~ as the specific
sheet-like object passes ~~said the~~ sensor cells.

3. (Currently Amended) The method as claimed in claim 2, wherein the sheet-
like ~~characterised in that said sheet-like objects are illuminated with infra-red light.~~

4. (Currently Amended) The method as claimed in claim 2, further comprising:
~~characterised in that a set of dedicated test spots is determined~~ determining test
spots for said for the specific sheet-like object, wherein and said the two-dimensional
evaluation for ~~said the~~ specific sheet-like object is ~~solely~~ carried out for only said the ~~set of~~
test spots.

5. (Currently Amended) The method as claimed in claim 4, wherein ~~characterised~~
~~in that said the~~ test spots are defined by applying image processing ~~said to the~~ transmission

image and ~~said the~~ reflection image, ~~thereby considering said based on a position, said an~~ angle and known parameters of an object type of ~~said the~~ specific sheet-like object.

6. (Currently Amended) The method as claimed in claim 5, ~~characterised in that~~ ~~said wherein the~~ test spots are ~~determined such that they are~~ positioned outside of an exclusion area of ~~said the~~ specific sheet-like object, ~~said the~~ exclusion area comprising at least one of the following object areas:

a) an area of ~~said the~~ specific sheet-like object ~~with~~ having at least one of a dark print, a foil, a hologram ~~or and~~ a thread,

b) an area within a given maximum distance ~~to from~~ an edge of ~~said the~~ specific object sheet-like object, ~~or and~~

c) an area, ~~particularly a rectangular area,~~ in each corner of ~~said the~~ specific sheet-like object.

7. (Currently Amended) The method as claimed in claim 4, ~~characterised in that~~ ~~said wherein the~~ test spots are grouped in a plurality of overlapping regions of ~~said the~~ specific sheet-like object, the method further comprising:

determining an ~~where first an~~ independent double feed detection result is ~~determined~~ for each ~~region~~ region of the plurality of overlapping regions; and

determining second an overall double feed detection result is ~~determined~~ by combining ~~said the~~ independent double feed detection ~~results~~ result of each region.

8. (Currently Amended) The method as claimed in claim 5, further comprising: ~~characterised in that said specific object is validated in a first step~~ determining an object type of the specific sheet-like object; and

validating the specific sheet-like object,

wherein the two-dimensional evaluation method to detect the double feed is only applied if the specific sheet-like object is validated. ~~and said double feed is detected in a~~

~~second step only if said specific object has correctly been validated, where said object type of said specific object is determined during said first step of validating said specific object.~~

9. (Currently Amended) An apparatus Apparatus for processing one or more types of sheet-like objects, ~~particularly banknotes, having comprising:~~

a transport path;

a transporter that conveys the transport means for conveying said sheet-like objects along a transport ~~the transport~~ path in a moving ~~direction and~~ direction;

a detector for an optical detection of that optically detects a double feed of said objects ~~the objects, said detector~~ the detector comprising comprising:

an illuminator that illuminates the ~~illumination means for illumination of said sheet-like objects, particularly with infra red light, objects;~~

a transmission-type sensor for producing a transmission image of said objects by that measuring measures the transmission intensities of light transmitted through the sampling points of said objects, ~~the sheet-like objects;~~

a reflection-type sensor for producing a reflection image of said objects by measuring that measures the reflection intensities of light reflected from said objects ~~the sampling points of the sheet-like objects;~~ and

an evaluator that performs a ~~which is built such that a two-dimensional evaluation can be carried out where by forming a first dimension is formed by said from the transmission intensities and a second dimension is formed by said from the reflection intensities, the evaluator being adapted to carry out the steps of determining the location determining locations of said points~~ the sampling points in said two the first and second dimensions, and comparing said comparing the locations with a linear decision boundary.

10. (Currently Amended) ~~The apparatus~~Apparatus as claimed in claim 9, ~~characterised in that said illumination means comprise the illuminator comprising:~~

a first elongated illumination unit for illumination of a first surface of ~~said the~~ sheet-like ~~objects~~objects; and

a second elongated illumination unit for illumination of a second surface of ~~said the~~ sheet-like objects, ~~each illumination unit preferably comprising a multitude of light sources arranged in line.~~

11. (Currently Amended) The apparatus as claimed in claim 10, ~~characterised in that said wherein the~~ transmission-type sensor comprises an array of sensor cells ~~and said cells, the~~ reflection-type sensor comprises an array of sensor ~~cells where said cells, and the~~ elongated illumination units and ~~said the~~ arrays of sensor cells are arranged perpendicular to ~~said the~~ moving direction of ~~said the~~ transport path.

12. (Currently Amended) The apparatus as claimed in claim 11, ~~characterised in that wherein~~ each sensor cell comprises a light sensitive device ~~for measuring said that~~ measures the intensities of light, the detector further comprising:

~~and an optical means device, particularly a rod lens, for directing said that~~ directs the transmitted or reflected light onto ~~said the~~ light sensitive device.

13. (Currently Amended) Apparatus as claimed in claim 11, the detector further comprising:

~~characterised in that said detector comprises exactly one array of sensor cells forming said transmission type sensor as well as said reflection type sensor and a controller for that alternately switching said switches the~~ illumination units on and off and alternately ~~measuring said measures the~~ intensities of light transmitted through or reflected from ~~said the~~ sheet-like objects ~~respectively, wherein exactly one array of sensor cells forms the~~ transmission-type sensor and the reflection-type sensor.

14. (Currently Amended) The apparatus as claimed in claim 10, ~~characterised in that it comprises~~further comprising:

a validator ~~for a validation of said~~that determines the validity of the sheet-like objects, ~~said wherein validator and said detector being built such that said validation is carried out before said~~ the validator determines the validity of the sheet-like objects before the detector ~~optical detection~~optically detects a double feed and ~~such that said optical detection is carried out~~ the detector optically detects a double feed only if ~~said validation of said objects has been carried out correctly~~the validator validates the sheet-like objects.

15. (New) The method as claimed in claim 1, wherein the sheet-like objects are banknotes.

16. (New) The apparatus as claimed in claim 9, wherein the sheet-like objects are banknotes.

17 (New) The method as claimed in claim 6, wherein the area in each corner of the specific sheet-like object is substantially rectangular.

18. (New) The apparatus as claimed in claim 10, wherein each of the first and second elongated illumination units comprises a multitude of light sources arranged in a line.

19. (New) The apparatus as claimed in claim 12, wherein the optical device is a rod lens.